

Impact of Migrant Labor Restrictions on the Agricultural Sector

American Farm Bureau Federation – Economic Analysis Team

February 2006

Preface

This report assesses the impact on U.S. agriculture of eliminating access to migrant farm labor.¹ The report concludes that the agricultural sector would suffer significant economic losses if the law that governs the hiring of migrant labor were changed without providing for a viable guest worker program and a reasonable transition into such a program.

I. Introduction/Summary

Of all the major sectors of the U.S. economy, agriculture is the most dependent on migrant labor. After almost a century of transferring excess labor to the rest of the economy, agriculture's demand for labor has stabilized at approximately 3 million workers. Of these 3 million workers required to operate the sector, approximately 2 million are drawn from farm families and about 1 million are hired from non-family sources. An estimated 500,000 or more of this 1 million would be affected by restrictions on the hiring of migrant labor.

This report concludes that if agriculture's access to migrant labor were cut off, as much as \$5-9 billion in annual production of primarily import-sensitive commodities most dependent on migrant labor would be lost in the short term. Over the longer term, this annual loss would increase to \$6.5-12 billion as the shock worked its way through the sector. This compares to an annual production average for the entire agricultural sector of \$208 billion over the last decade.

Production of fresh fruits, vegetables, and nursery products would be hit hardest as 10-20 percent of output would shift to other countries, and increasing the U.S. trade deficit on virtually a dollar-for-dollar basis. A fifth to a third of production for the fastest growing fresh component of the fruit and vegetable market would be lost. An adequate labor force is critical to the economic health of our fruit and vegetable industry. Fruit and vegetable production is labor intensive and producers are already confronted with competitiveness issues due to low cost labor available in competing markets.

Costs would rise and production would fall in the other field crop and livestock sectors which are not as sensitive to imports or as dependent on migrant labor. With higher costs, these farm operators would produce a smaller volume of products ranging from

¹ The term "migrant labor" as used in this report refers to foreign-born workers who travel to the U.S. for employment in the agricultural sector. The report does not consider migrant labor working in agriculture-related industries such as the livestock slaughter and packing industry. This definition is consistent with the definition used in USDA survey activities but differs from the definition of migrant labor (any and all workers who routinely move to different work sites) used in the Department of Labor survey activities and reporting.

grains, oilseeds and cotton to meat and milk. However, with labor accounting for a smaller share of costs, the drop in production would be more limited than in the fruit and vegetable sector. In addition, with the U.S. a major exporter rather than importer of most of these products, import displacement would be minimal. Hence, most of the impact on field crop and livestock operations would be concentrated in higher costs on remaining production.

The impact of this combination of lower production and higher costs on the farm sector as a whole would be a \$1.5-5 billion loss in farm income in the short term and a \$2.5-8 billion loss in the longer term (Table 1). The drop in production would reduce market receipts and net farm income. With farmers being price-takers rather than price-makers, much of the increase in production costs would also have to be paid for out of farm income. Aside from the specialty crop sector, this combined farm income impact would be most pronounced in livestock operations (such as dairy) where structural changes have increased dependence on hired labor. In dairy and many other livestock categories, the typical farm family workforce has simply become too small to operate enterprises large enough to capture economies of scale. These losses compare to a sector income average of \$56 billion per year over the last decade.

Table 1. Losses in Farm Production and Income With the Elimination of Migrant Labor

Loss Type	\$Billion
Production Loss	
Short Term	5.0 - 9.0
Long Term	6.5 - 12.0
Cost Increase on Remaining Production	
Short Term	2.5 - 7.0
Long Term	3.0 - 9.0
Income Loss from Reduced Production and Cost Increase	
Short Term	1.5 - 5.0
Long Term	2.5 - 8.0

Adjustments would have to be made in all of the states (Table 2). However, adjustments would be largest in California, Florida, Washington, Oregon, Texas, North Carolina, Michigan, Idaho, Arizona, and New York. States with extensive fruit, vegetable, and nursery operations and large industrialized livestock operations would be the most severely impacted. But the majority of commercial field crop operations has grown large enough to need hired labor and would also face considerable adjustment challenges.

The reason for these losses is simple. There is no readily available pool of excess labor in the farm sector, the rural economy, or the general economy to draw upon to replace 500,000 or more migrant workers. The sector has already exhausted most on-the-shelf

mechanization alternatives and next-generation robotics are decades away. Hired farm worker wages would have to increase significantly above and beyond the increases necessary over the last two decades to attract and hold workers in an increasingly tight labor market. This effort to replace lost migrant farm workers would be complicated by the demanding and often seasonal nature of many hired jobs in agriculture. It would be further complicated by similar efforts by employers in other sectors of the economy affected by migrant worker restrictions to attract and hold their own replacement workers. At a minimum, hired farm worker wages would have to increase from the current \$9.50 average to possibly \$11 to \$14 per hour or more in order to attract and hold labor currently employed in other jobs requiring comparable skills.

The analysis reported here draws on farm labor data developed by USDA and the Department of Labor (DOL) and basic labor supply and demand relationships to estimate the wage impact of replacing lost migrant labor.² The analysis then uses farm income accounts developed by USDA as part of the income reporting program as well as Census of Agriculture data on the distribution of farm income to estimate sector vulnerability to higher labor costs.³ The relationships built into the agricultural sector model developed at the University of Missouri's Food and Agricultural Policy Research Institute (FAPRI) were then used to estimate farm economy impacts.

The main body of this report looks first at the changing supply and demand for hired farm labor. The second section looks at several of the factors driving farm labor demand. The third section looks at the impact of bidding for hired farm labor, and the fourth section looks at mechanization as a possible answer to labor shortages. The report then looks at the key components of a viable guest worker program from an agricultural economic perspective. The report closes with a methodology section.

² The two most important sources of data are the National Agricultural Labor Survey (NALS) conducted by USDA's National Agricultural Statistics Service and the National Agricultural Workers Survey (NAWS) conducted by the Department of Labor.

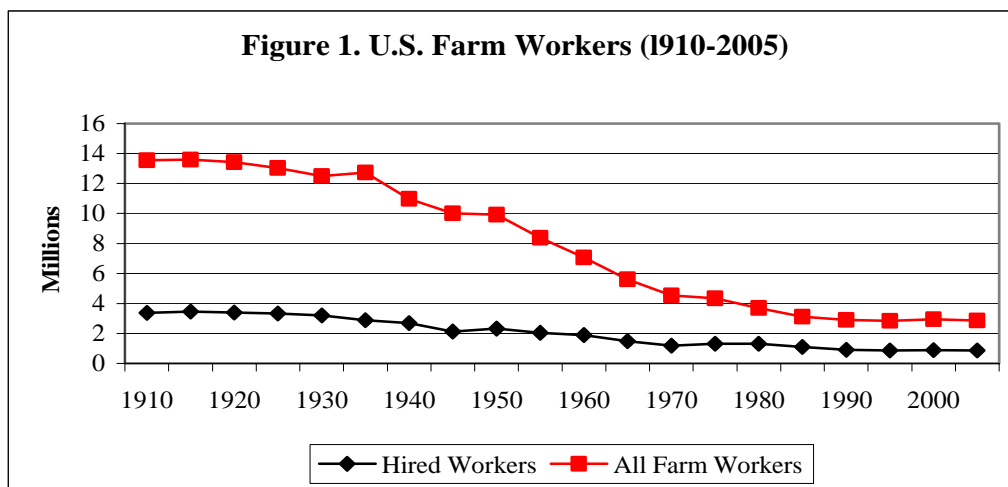
³ USDA's farm income information is available at www.ers.usda.gov/data/FarmIncome and www.usda.gov/data/ARMS while the Census of Agriculture data is available at www.nass.usda.gov/census.

Table 2. State Impacts of Migrant Labor Restriction

State	Short Term				Long Term			
	Production Loss		Income Loss		Production Loss		Income Loss	
	Low	High	Low	High	Low	High	Low	High
	\$Million							
United States	5,000.0	9,000.0	1,500.0	5,000.0	6,500.0	12,000.0	2,500.0	8,000.0
Alabama	34.8	62.6	10.4	34.8	45.2	83.5	17.4	55.6
Alaska	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Arizona	114.1	205.3	34.2	114.1	148.3	273.8	57.0	182.5
Arkansas	7.9	14.2	2.4	7.9	10.2	18.9	3.9	12.6
California	1,733.1	3,119.6	519.9	1,733.1	2,253.0	4,159.5	866.6	2,773.0
Colorado	59.9	107.8	18.0	59.9	77.8	143.7	29.9	95.8
Connecticut	26.9	48.4	8.1	26.9	35.0	64.5	13.4	43.0
Delaware	10.7	19.2	3.2	10.7	13.9	25.6	5.3	17.1
Florida	560.4	1,008.7	168.1	560.4	728.5	1,344.9	280.2	896.6
Georgia	100.5	180.8	30.1	100.5	130.6	241.1	50.2	160.7
Hawaii	50.6	91.0	15.2	50.6	65.7	121.3	25.3	80.9
Idaho	147.1	264.9	44.1	147.1	191.3	353.2	73.6	235.4
Illinois	46.5	83.7	13.9	46.5	60.4	111.6	23.2	74.4
Indiana	29.0	52.2	8.7	29.0	37.7	69.6	14.5	46.4
Iowa	10.4	18.8	3.1	10.4	13.6	25.1	5.2	16.7
Kansas	7.6	13.7	2.3	7.6	9.9	18.3	3.8	12.2
Kentucky	14.1	25.4	4.2	14.1	18.3	33.8	7.1	22.6
Louisiana	47.4	85.3	14.2	47.4	61.6	113.8	23.7	75.8
Maine	23.2	41.8	7.0	23.2	30.2	55.7	11.6	37.2
Maryland	41.5	74.7	12.5	41.5	54.0	99.6	20.8	66.4
Massachusetts	39.3	70.8	11.8	39.3	51.1	94.4	19.7	63.0
Michigan	151.0	271.8	45.3	151.0	196.3	362.4	75.5	241.6
Minnesota	83.1	149.6	24.9	83.1	108.0	199.5	41.6	133.0
Mississippi	11.8	21.2	3.5	11.8	15.3	28.3	5.9	18.8
Missouri	18.0	32.4	5.4	18.0	23.4	43.2	9.0	28.8
Montana	12.5	22.6	3.8	12.5	16.3	30.1	6.3	20.0
Nebraska	25.8	46.5	7.8	25.8	33.6	62.0	12.9	41.4
Nevada	6.1	11.1	1.8	6.1	8.0	14.7	3.1	9.8
New Hampshire	10.4	18.7	3.1	10.4	13.5	24.9	5.2	16.6
New Jersey	64.5	116.1	19.4	64.5	83.9	154.8	32.3	103.2
New Mexico	32.1	57.8	9.6	32.1	41.8	77.1	16.1	51.4
New York	99.2	178.6	29.8	99.2	129.0	238.2	49.6	158.8
North Carolina	158.7	285.7	47.6	158.7	206.3	380.9	79.4	254.0
North Dakota	52.4	94.4	15.7	52.4	68.2	125.9	26.2	83.9
Ohio	88.7	159.7	26.6	88.7	115.3	212.9	44.4	141.9
Oklahoma	44.9	80.9	13.5	44.9	58.4	107.8	22.5	71.9
Oregon	188.1	338.5	56.4	188.1	244.5	451.4	94.0	300.9
Pennsylvania	97.2	175.0	29.2	97.2	126.4	233.3	48.6	155.5
Rhode Island	8.5	15.4	2.6	8.5	11.1	20.5	4.3	13.7
South Carolina	36.6	65.8	11.0	36.6	47.5	87.7	18.3	58.5
South Dakota	8.3	15.0	2.5	8.3	10.8	20.0	4.2	13.3
Tennessee	33.4	60.2	10.0	33.4	43.5	80.2	16.7	53.5
Texas	180.1	324.2	54.0	180.1	234.1	432.2	90.0	288.2
Utah	9.4	17.0	2.8	9.4	12.3	22.6	4.7	15.1
Vermont	9.9	17.8	3.0	9.9	12.8	23.7	4.9	15.8
Virginia	37.6	67.7	11.3	37.6	48.9	90.3	18.8	60.2
Washington	327.8	590.0	98.3	327.8	426.1	786.7	163.9	524.5
West Virginia	5.9	10.7	1.8	5.9	7.7	14.3	3.0	9.5
Wisconsin	84.1	151.4	25.2	84.1	109.3	201.8	42.0	134.5
Wyoming	8.6	15.5	2.6	8.6	11.2	20.7	4.3	13.8

II. Changing Supply and Demand for Hired Farm Labor

In the mid-1980s, after almost a century of transferring surplus labor to the rest of the economy, the farm labor market shifted into balance, with the supply of readily available labor roughly equal to the labor needed to operate the sector. Figure 1 makes this point drawing on USDA data collected as part of its agricultural labor survey activities. As recently as the 1960s and 1970s, the farm work force declined by 100,000- 200,000 workers per year. From 1985 forward, however, the sector has operated with a more or less steady workforce of just under 3 million. About 2 million of these workers come from within the farm sector and include farm operators and their family members. About 1 million are hired from non-family sources.



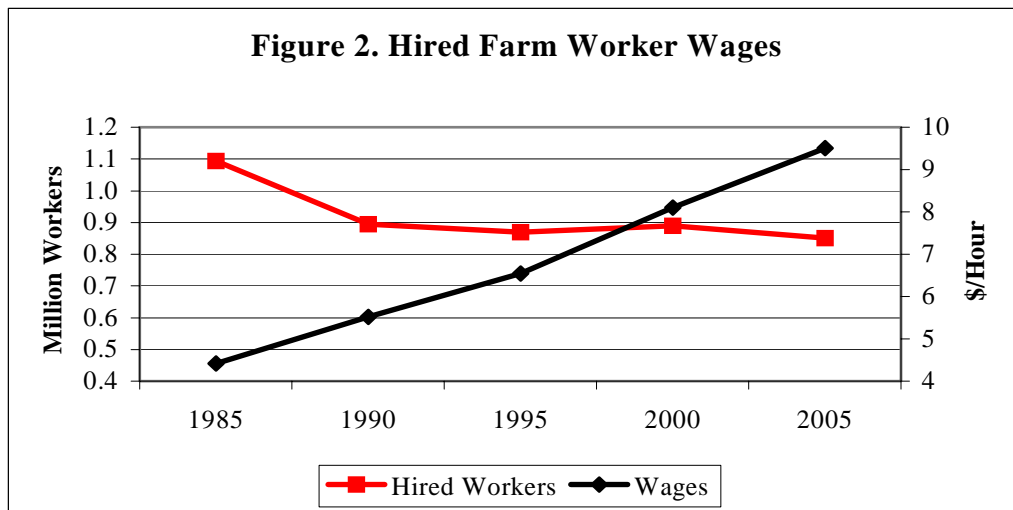
The current 2 million farm family workers is an all-time low and reflects several demographic factors including the size and aging of the farm operator pool, decreasing farm family size, and the continued movement of people off the farm. As recently as 1960, the farm family work force was over 5 million. Since then, however, Census of Agriculture data indicate that the farm operator pool has steadily decreased in size and has aged as fewer beginning farmers have entered the pool and the proportion of farmers at or past retirement age has hit successive all-time highs.

The Census Bureau's population estimates indicate that average farm family size has also decreased sharply over this same period, reflecting both a general trend in the overall population and the fact that older farmers generally have fewer family members to draw on in operating the farm. In addition, the Census Bureau's population estimates show that the farm population continued to shift to jobs elsewhere in the rural economy or the urban sector. Combined, these factors translate into the smallest family farm labor pool on record.

In absolute terms, the labor force hired to augment farm family labor has also declined over time. As many as 2 million hired workers (less than a fourth of the total) were

drawn from the rural economy as recently as the 1960s. Since 1985, the number has stabilized at the current level of 1 million. Measured as a share of the total farm work force (one-third), this figure is at an all-time high.

This change in the balance between farm labor supply and demand has been reflected in increased hired worker wages (Figure 2). USDA’s National Agricultural Labor Survey indicates that the average hired farm worker wage in 1985 was \$4.50 per hour. This was close to the minimum wage in effect for the general economy and included a very limited benefits package. By 2005, the wage had increased to \$9.50 per hour and included an improved benefits package that pushed the average cost up to \$11-12 an hour. This compares with a 2005 minimum wage of \$5.15 per hour and DOL survey results showing wages in representative jobs with similar skill requirements ranging from \$6.65 per hour for food preparation to \$11 for janitorial workers and \$14.34 for construction labor, according to DOL surveys.



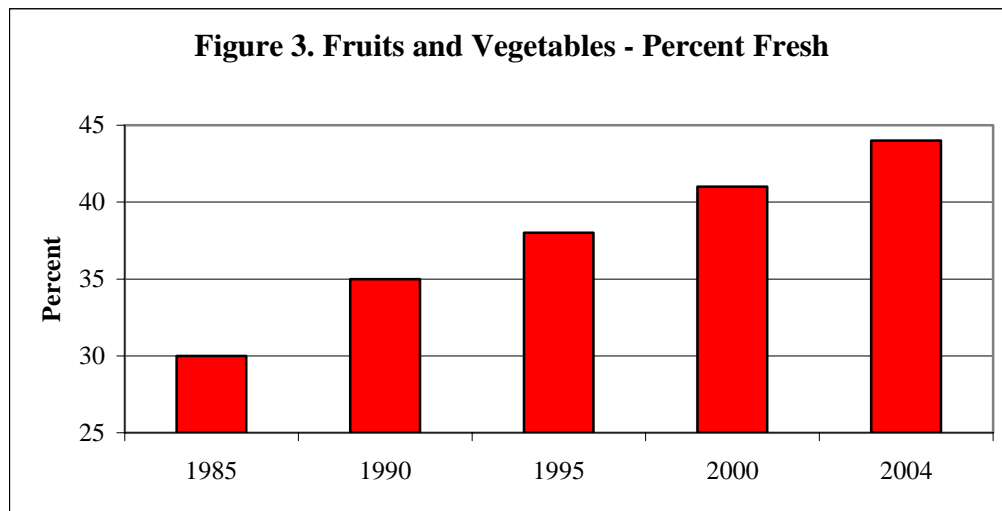
III. Factors Driving Farm Labor Demand

This farm sector demand for 3 million workers reflects several factors. The long-standing substitution of capital for labor reduced the demand for labor. Sustained increases in labor productivity allowed farmers to operate with less labor. Offsetting this, however, were changes in consumer demand, farm structure, and farm size that worked in reverse to increase demand for labor.

For example, consumer demand for farm products has changed dramatically since 1985. The change has been especially pronounced in the fruit and vegetable sector, where demand for fresh products has increased from 30- 45 percent of an expanding produce consumption total (Figure 3). Where possible, growers have met this demand using existing resources – particularly machinery resources. However, the fresh market puts a premium on top quality, peak ripeness and visual appeal. This limits the extent to which

functions such as picking and packing can be mechanized. Existing mechanization technology often cannot meet added technical concerns such as lack of uniform maturity, incomplete fruit removal, and differences in readiness criteria common in the specialty sector. Simply stated, human dexterity and judgment are necessary in the fresh produce sector.

This dependence on labor is reflected in produce costs and prices. Fresh fruits and vegetables meeting stringent consumer expectations can receive a 50-100 percent premium over produce used for processing. However, hired labor costs for operations specializing in production for the fresh market also range from one-third to over half of the total cost of production. This compares to an agricultural sector labor cost average of 14 percent.

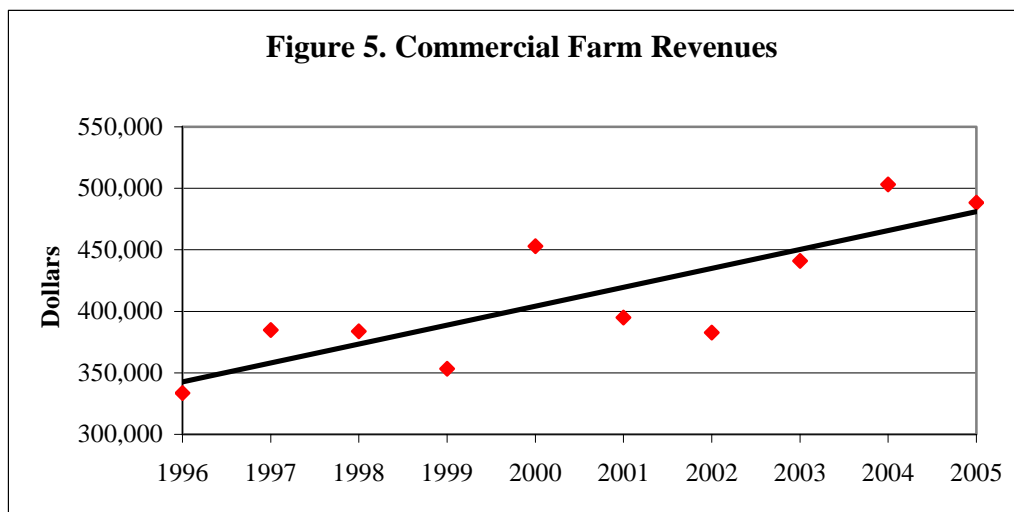
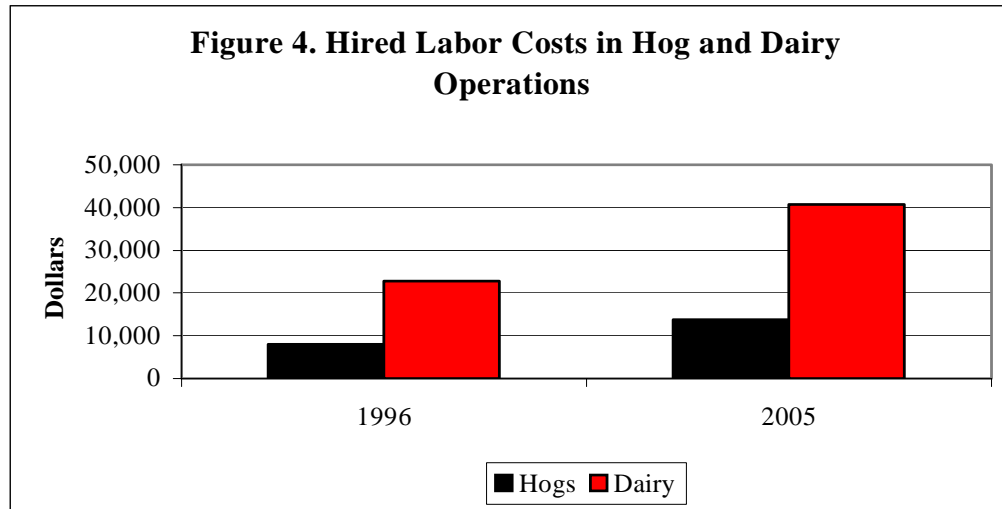


Structural changes in the livestock and field crop sectors have also reinforced dependence on hired labor. These changes – the so-called “industrialization” of agriculture – have brought technological advances that have meant new ways to produce and market farm products. Increasingly, farms using the latest technology in the livestock sector simply require more labor than a farm operator family can generally provide.

For example, the typical dairy farm identified in the Agricultural Resource Management Survey conducted by USDA’s Economic Research Service (ERS) reported spending \$21,000 on hired labor as recently as 1995 (Figure 4). However, the same operation spent \$40,000 in 2004 as machinery operation and livestock management jobs grew more demanding. While relatively slower, growth in dependence on hired labor in the field crop sector has been significant as more mechanized operations require more labor to run high-cost machinery than most operators can provide.

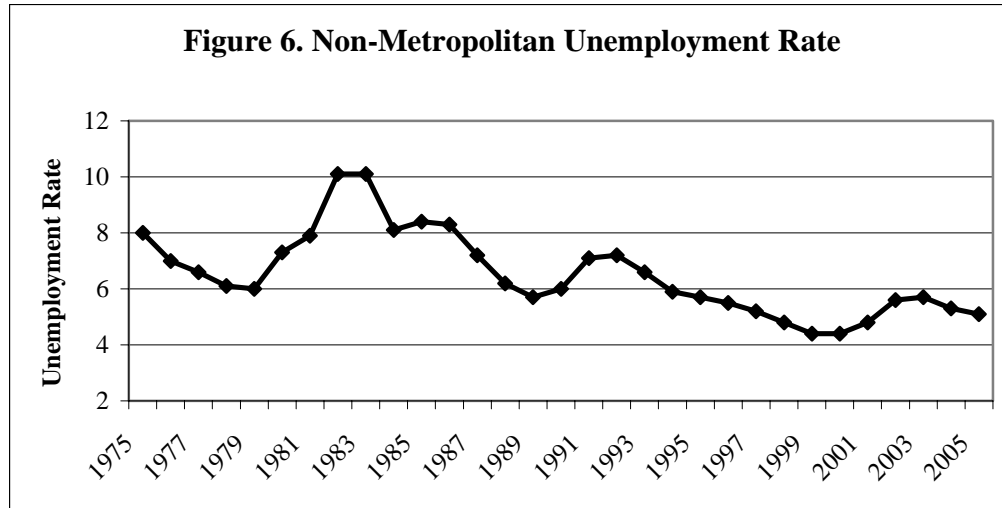
Looking more broadly across the entire agricultural sectors, growth in the average size of farm enterprises indicates that commercial production has simply outgrown family labor.

The typical commercial enterprise (i.e., farms selling more than \$100,000 in products per year) increased from sales of about \$335,000 per year to over \$480,000 over the last decade. Supplementing this USDA survey data with Census of Agriculture data suggests size in the mid-1980s was below \$275,000. These farms produce about 85 percent of the sector's output and account for an equally large share of labor. In a growing number of cases, even after adjusting for inflation, these operations are simply too large to operate with family labor alone (Figure 5).



Meeting this hired labor need has become an increasingly demanding part of farm management. Reference has already been made to the declining farm family work force. Changing demographics have also made it difficult to attract and hold a hired farm work force. As Figure 6 indicates, unemployment in the broader rural economy has been low and is currently near what is commonly viewed as a 5 percent structural minimum. Rural

unemployment has been lower than the current rate (5.3 percent) in only four of the past thirty years. There are fewer rural workers available for farm work today than there have been in nearly all of the last three decades.



The potential for drawing on urban workers is also limited. The urban unemployment rate is comparable to the rural rate and is also near structural minimums. Moreover, farm employment is typically located too far from cities where the number of individuals unemployed is high, even if unemployment rates are roughly comparable. The Census Bureau’s population data on employment indicate that urban workers have historically been hesitant to relocate to rural areas. Even farm operators located closer to urban areas report difficulty in drawing the urban unemployed to farm jobs. Hence, there is no easy way to fill farm jobs with the urban unemployed.

Perhaps even more telling, however, is the fact that farm jobs are difficult to fill with either the rural or urban unemployed given the nature of the work involved. This is particularly true in the fruit, vegetable and nursery sector where approximately half of hired workers are employed and where the work requires difficult manual labor. Nor is it a “job” in the conventional sense that some take it to be. The work at any one location can be temporary, and sustained employment often requires the willingness and ability to move from site to site over a broad area and work for more than one employer, coinciding with the crop-harvesting calendar. But even site-specific jobs in the livestock and field crop sectors are difficult to fill despite the significantly lower wages that the DOL reports for jobs elsewhere in the economy with comparable skill requirements.

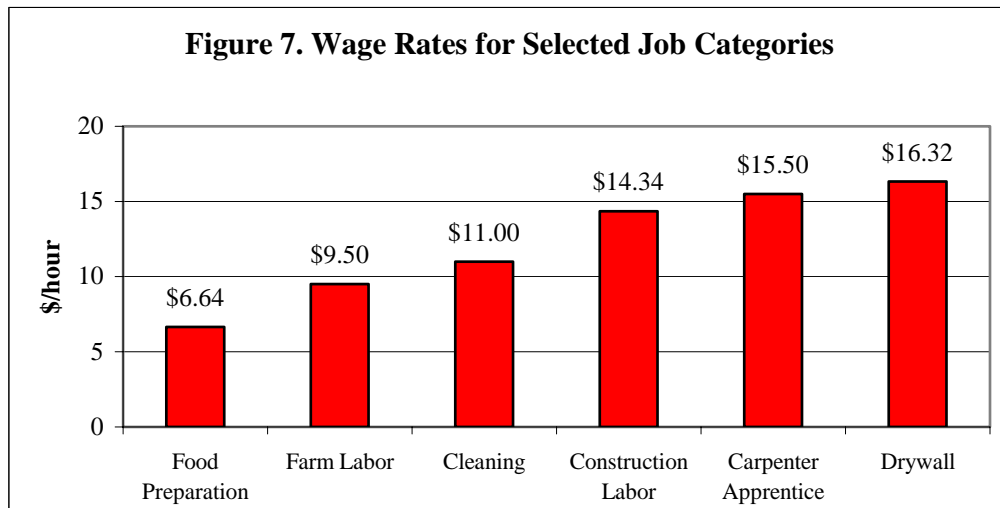
IV. Bidding for Hired Labor

In this setting of balanced farm labor supply and demand, a change in federal law that effectively cuts off farmers’ access to migrant labor would necessarily force the agricultural sector to bid in the general economy for replacement workers. While there is

no precise count of the migrant workers that would be affected, DOL’s National Agricultural Worker Survey suggests that 500,000 – 50 percent of agriculture’s hired work force – would be affected. Other, less formal, counts put the number affected significantly higher.

How high agriculture would have to bid to replace this large a share of its workforce would depend on labor supply and wages in the general economy for jobs with similar skill requirements. DOL surveys of wages and employment identify large pools of workers and the average wages for these pools. Figure 7 shows *representative* pools and wages for a range of jobs with skills comparable to those typically required of hired farm workers.

The DOL surveys indicate that the number of workers now employed in food preparation at wages averaging \$6.65 per hour far exceed the number that would be needed in agriculture. As already noted, farm wages average \$9.50 per hour. Food preparation workers could raise their earnings today by switching to farm employment, yet very few do. Agricultural employers have not been able to enlist these workers in farm employment, and that fact is buttressed by widespread, anecdotal reports from farm operators about recruitment difficulties. In short, the perception of farm jobs is such that a large segment of the native worker population apparently prefers to take lower paying food preparation jobs rather than higher paying farm jobs.



DOL surveys indicate that there are two other representative pools of workers that are large enough and the skill requirements comparable enough that they could supply agriculture’s replacement needs: a janitorial classification with wages averaging \$11 per hour and a construction laborer classification with wages averaging \$14.35 per hour. With workers in lower paying jobs such as the food preparation classification choosing not to work in agriculture, farm operators would have to bid for workers in these higher-

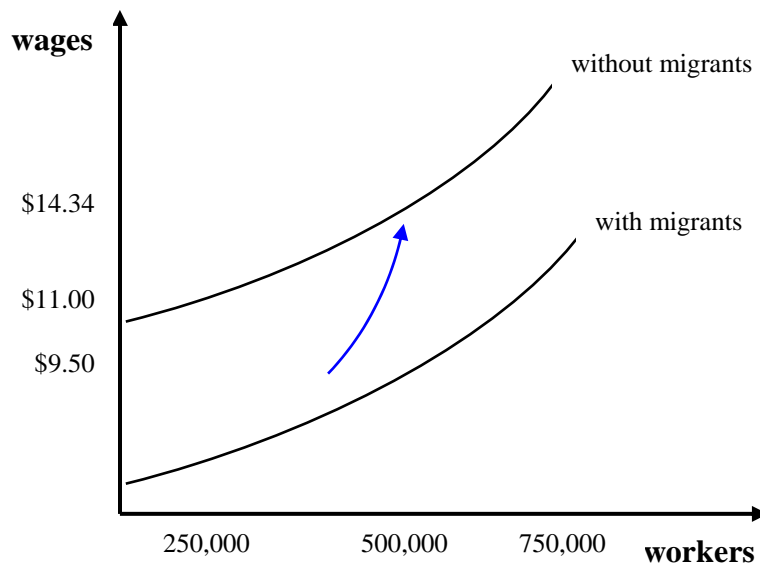
paid categories to replace migrant workers. This would entail raising wages from the current average of \$9.50 to possibly \$11-14 per hour.

While there are more than enough workers in the janitorial category with \$11 per hour wages to fill agriculture's replacement needs, several considerations suggest that replacement wages would have to tend toward the upper end of this \$11-14 range. First, the number of replacement workers needed would be large compared to the number of workers in this pool. Many workers in this pool would likely choose to stay in their current jobs. This suggests that agriculture would have to be prepared to tap the higher paid construction worker pool. This replacement effort would be complicated by the fact that, as already noted, farm work is often perceived as less desirable work.

Second, employers in these higher wage pools would likely respond to any significant loss of labor to agriculture with wage increases of their own to maintain their workforce. Equally important, these other sectors also employ migrant workers and would be affected by hiring restrictions. Hence, they would face the same replacement pressure – albeit less acutely than agriculture given the smaller proportion of migrant labor in their overall work forces – as farm operators.

As Figure 8 indicates, this broader pressure to find replacement workers would tend to drive up wages generally. Theoretically, the labor supply curve describing the number of workers available at specific wages would shift up and to the right. This means that, all other factors constant, the cost of the same number of workers providing the same services would be higher even before a specific sector such as agriculture moved to attract workers from elsewhere in the economy.

Figure 8. Migrant Farm Labor Supply Curve

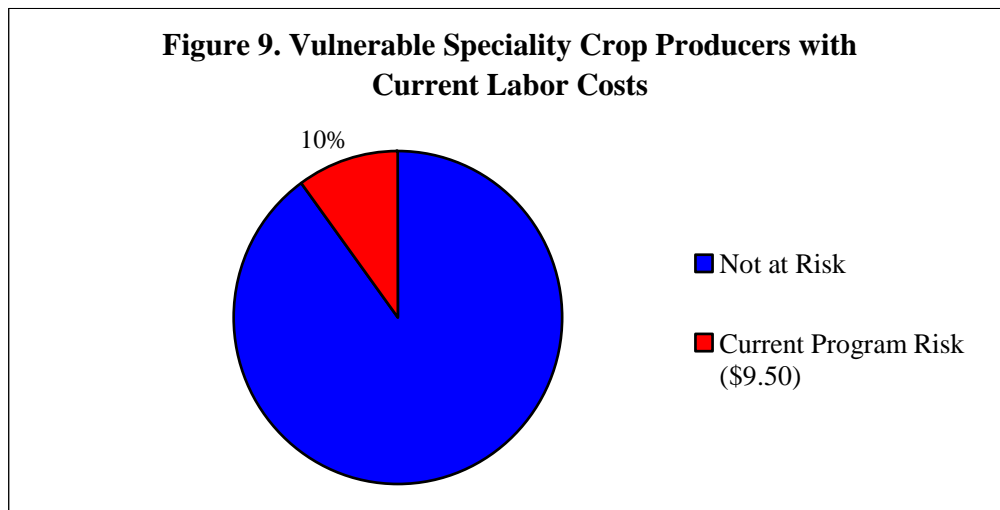


The impact of increasing the average hired wage from \$9.50 into this \$11-14.35 per hour range on the sector would vary depending on producers' use of migrant labor. As already noted, half of this replacement labor would be demanded by fruit, vegetable and nursery producers, particularly for fresh produce operations. This dependence on migrant labor combined with their exposure to imports suggests that the greatest impact would be in this sector.

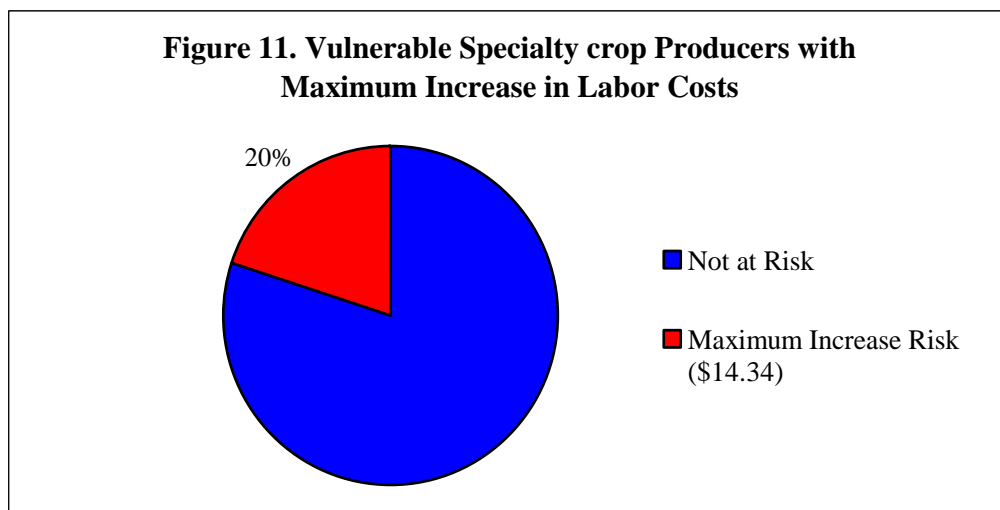
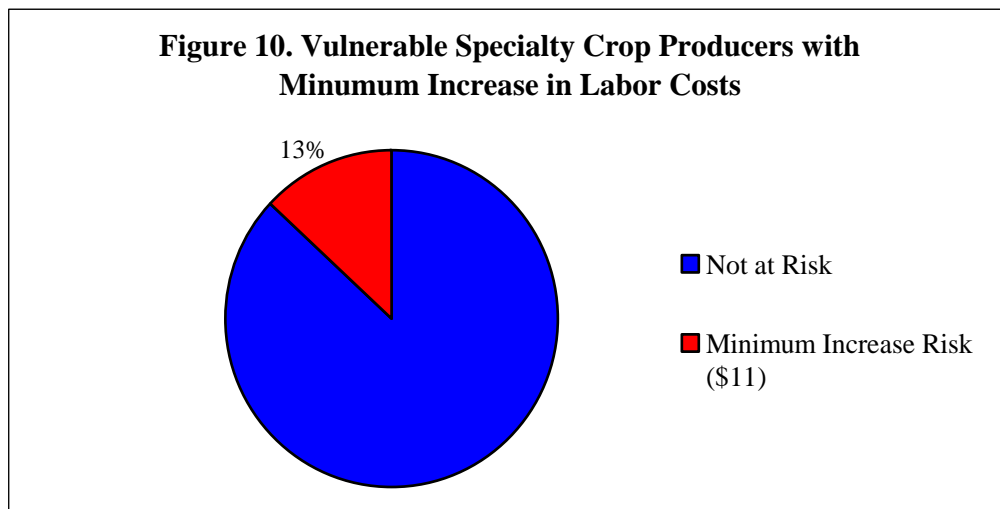
USDA's Agricultural Resources Management Survey provides a snapshot of the financial health of these fruit, vegetable, and nursery producers and an indication of the impact a significant increase in labor costs would have. Surveys from 2003 indicate that, on average, about 10 percent of producers in the specialty crop category are financially vulnerable (Figure 9). That is, these producers report negative farm incomes and debt-to-asset ratios over 40 percent. They are currently generating too little revenue to pay all of their bills and have essentially borrowed what most banks will lend on farm assets.

USDA's farm income records and farm financial analysis indicate that, historically, operations in this category are most dependent on continuation of the status quo – in this case continuation of a \$9.50 wage. However, while operating at the margin, these producers supply a significant share of sector production. And with year-to-year developments in weather and local marketing circumstances, producers can shift in and out of this category over time.

With migrant labor eliminated and replacement labor costs up 16-51 percent, the situation would worsen significantly for these vulnerable producers. Fresh fruit and vegetable producers most dependent on hired migrant labor would be the most severely affected. However, the rest of the specialty crop sector would also face sharp cost increases. We expect that the 11 percent of fruit, vegetable and nursery producers who fall into this "vulnerable" category would ultimately fail with the replacement of \$9.50 per hour labor with \$11-14 per hour labor (Figure 9).



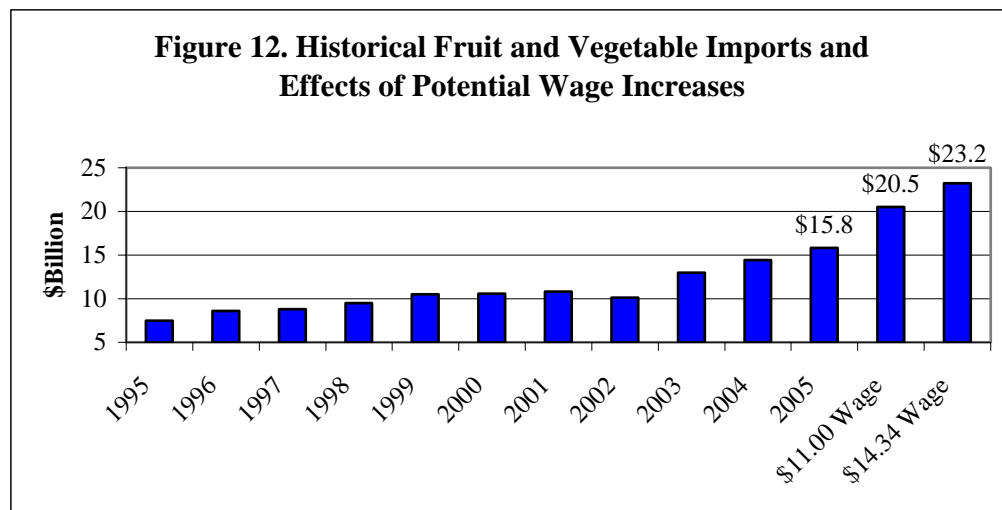
A significant increase in labor costs would also pull some share of producers who are not vulnerable with \$9.50 per hour labor into the vulnerable category with \$11-14 labor. USDA research on farm financial vulnerability and Census of Agriculture data on the distribution of farm income suggest that raising wages to \$11 per hour would move an additional 2 to 3 percent of fruit, vegetable and nursery producers into this vulnerable category (Figure 10). The same data indicate that raising wages to \$14.35 would likely put another 10 percent of these producers in this vulnerable category (Figure 11). It is important to note that this 10-20 percent loss would be for the fruit and vegetable sector as a whole. A fifth to a third of the fastest growing fresh fruit and vegetable component would be affected as production shifted abroad.



Since the loss of migrant labor would be permanent, these newly vulnerable producers would eventually go out of business as their losses accumulate and their borrowing options are exhausted. In short, while they would likely continue operating with a reasonably open labor market setting wages at \$9.50 per hour, they would not be able to continue operating with a closed labor market generating \$11-14 wages.

The loss in U.S. production would be roughly comparable with the loss of producers. USDA vulnerability research suggests that smaller producers make up a larger share of at-risk farmers. In this case, however, the challenge of finding replacement labor would tend to favor small producers. Small producers could, in theory, improvise by using overtime family labor, part time laborers or local replacement workers to a greater extent than larger operators faced with a much larger labor deficit. Hence, migrant labor restrictions would pull larger producers into the vulnerable category and keep the drop in production and producers roughly comparable.

The resulting loss of \$5-9 billion in fruit and vegetable production reflects not only wage increases but also the availability of large replacement supplies of fruits and vegetables from outside the U.S. The rapid growth in imports over the last decade indicates the readily available supply of foreign fruit and vegetables with U.S. farm wages at the current \$9.50 per hour (Figure 12).



Restricting migrant workers could well enhance foreign competitiveness even more than the increase in U.S. costs and expand the share of producers in the vulnerable category more than estimated here. Mexico, the chief U.S. supplier of specialty products, could well see its costs of production decrease as several million migrant workers were locked out of the U.S. and had to find employment at home. Surveys of Mexican fruit and vegetable production costs suggests that labor is the single largest expense and that access to a significantly larger labor pool would allow producers to market the same or larger volume at lower costs. A drop in Mexican prices of 10 percent, for example, would put significantly more U.S. producers at risk of failure.

With a significant share of U.S. specialty crop production essentially outsourced, the affected farm resources would be available for alternative uses. Normally, at least some of the resources of displaced producers are bought up by generally larger, more profitable operators. This works to reduce the net drop in production. Given USDA survey indications of the value of the resources (such as land and water) in question, the resources affected would generally have to continue to be used in high return activities such as specialty cropping. However, this potential for offsetting resource shifts would be limited in the migrant worker case since other operators normally looking to expand would themselves be under pressure due to higher labor costs.

The much smaller role played by hired labor and the more limited potential for imports would translate into a different adjustment in the rest of the agricultural sector. Loss of migrant labor would translate into higher production costs and the loss of a small proportion of field crop and livestock producers, most of whose resources would likely be bid away by more profitable operators. The agricultural sector models used at FAPRI and USDA to develop agricultural baseline projections suggest that the responsiveness of field crop and livestock sectors to increases in cost is approximately 0.2 (i.e., a 10-percent increase in costs is associated with a 2-percent decrease in production). Consequently, the drop in production would be small.

However, the vast majority of field crop and livestock producers who remained in business would face higher costs for their ongoing production activities. Given the farm sector's historical role as a price-taker rather than a price-maker, most of the cost increase associated with \$11-14 per hour labor could not be passed on in the form of higher prices. Historically, half or more of cost increases come out of farm income.

In conclusion, overall agricultural production would fall \$5-9 billion in the short term and \$6.5-12 billion in the longer term as the shock of a labor shortage and wages increases worked through the sector. This would be due to large losses in the fresh fruit and vegetable sector and smaller losses in the rest of the fruit and vegetable sector and in the field crop and livestock sectors (Table 1). Producers who remained in production would face a sector-wide increase in costs of \$2.5-7 billion in the short term and \$3-9 billion in the longer term.

These two impacts can be converted into a farm income loss using USDA's farm accounts to estimate the share of production dollars that normally accrue to farmers as income and the share of production expenses that typically come out of farm income. The farm accounts data suggest that 20-30 percent of production receipts accrue to farmers as income. The same accounts and the agricultural sectors models used here suggest that 50-66 percent of an increase in production expenses normally is paid out of income. These parameters change with the size of the change in production and expenses considered. Using them as guidelines, the production losses and cost increases estimated here translate into a \$1.5-5 billion income loss in the short term and \$2.5-8 billion loss in

the longer term (Table 1)⁴. These estimates compare to an annual farm income average of \$56 billion over the last decade.

Table 1. Losses in Farm Production and Income With the Elimination of Migrant Labor

Loss Type	\$Billion
Production Loss	
Short Term	5.0 - 9.0
Long Term	6.5 - 12.0
Cost Increase on Remaining Production	
Short Term	2.5 - 7.0
Long Term	3.0 - 9.0
Income Loss from Reduced Production and Cost Increase	
Short Term	1.5 - 5.0
Long Term	2.5 - 8.0

Note: See footnote 4

Given the limited experience agriculture and the broader economy has had with labor disruptions even approaching the magnitude involve in restricting migrant labor, these production and income estimates could prove conservative. Several factors could work to raise them substantially. For example, underlying the analysis is the assumption that labor moves freely and immediately between jobs in the U.S. economy. In other words, agriculture would pay more to bid labor away from the general economy while the majority of operators continue to function with higher costs but without interruption. Vulnerable producers leave the sector. In actual fact, labor markets are far more rigid and the adjustments more complicated. Moving 500,000 replacement workers between sectors would require considerable time and involve significant disruption.

This is a particularly important assumption in the agricultural sector, given production cycles that make many producers sensitive to short term disruptions. This potential for disruption is most marked in the fruit and vegetable sectors – i.e. the sector with the most perishable product and greatest dependence on migrant workers. However, vulnerability to labor disruption extends to livestock operations, such as dairy, and field crop

⁴ Note: For example, the \$1.5-5 billion in short term income loss assumes that \$4 billion out of the \$5-9 billion in lost production would have generated no income and that the income loss on the remaining \$1-5 billion (\$5-9 billion minus \$4 billion) would be \$250 million to \$1.25 billion. The \$2.5-7 billion in higher costs translate into \$1.25-3.5 billion in income loss, assuming farmers can only pass along half of their cost increase. This puts the total short term loss, after rounding to the nearest \$500 million, at \$1.5-5 billion. Over the longer term, the \$2.5-8 billion in income loss assumes that \$4 billion out of the \$6.5-12 billion in lost production would have generated no income and that the income generated on the remaining \$2.5-8 billion (\$6.5-12 billion minus \$4 billion) would be \$625 million to \$2 billion. The \$3-9 billion in higher costs translates into \$2-6 billion in income loss using a .66 long term ratio versus a .5 short term ratio for cost increases absorbed by farmers. Rounding to the nearest \$500 million puts the total income loss for the long term at \$2.5-8 billion per year.

operations faced with harvest-time labor needs. As a result, an analysis based solely on wage rates may seriously understate farm impacts. How restrictions on migrant labor were implemented would also be of critical importance. The estimates outlined here assume implicitly that restrictions were implemented with enough lead-time for the sector to adjust. Without this lead-time, the impact would be significantly greater than estimated here.

In addition, the analysis makes no provision for the upward pressure on wages above the \$14.35 per hour level that eliminating migrant workers could have. While there is no precise count of the total number of migrant workers currently in the U.S, even the 10-11 million estimates at the low end of the range would be large enough to spark an economy-wide increase in wages. In this setting, agriculture would have to match the new wages in effect rather than the old \$11-14 per hour wages. This could also increase farm sector adjustment costs significantly.

Other factors could potentially work to lower adjustment costs. For example, the estimates describe here also make no provision for the sector's capacity to make structural changes that minimize the need to hire replacement labor. This would work to lower adjustment costs. While limited in the short term, the sector has adjusted to input cost increases in the past by modifying production technologies and changing the mix of inputs used in the production process. The adjustment that comes to mind immediately is falling back on the substitution of machinery for labor. As the following discussion suggests, however, the potential in the short term of one to five years is limited at best.

V. Mechanization

One alternative to the adjustments identified in this report often cited by supporters of restricting migrant workers is increased mechanization. However, a closer look at the supply of mechanization technology on the shelf, the long lead-time involved in developing new technology and the changing nature of hired labor demand suggests that mechanization would have a very limited role to play in the short and intermediate term.

Farmers have historically favored development and adoption of mechanization technology as a means of controlling costs, boosting incomes and minimizing the difficulties involved in hiring and retaining non-family labor. Consequently, most of the ready stock of mechanization technology has already been adopted. Decreased public and private investment in research and development over the last two decades has also worked to limit new technology in the pipeline. Given the farm sector's past experience with mechanization, the lead-times in question could be 10-15 years.

Mechanization of processing tomatoes, for example, took 10-15 years from the late 1940s through the early 1960s. There were none of the challenges associated with fresh fruits and vegetables where quality and appearance are at a premium. The process involved a concerted effort by several universities' agricultural engineering departments, USDA support and strong grower interest. Once available, the technology was quickly adopted and proved to be a major factor in making the U.S. one of the most competitive producers

of processing tomatoes in the world. But the quick adoption once there was a prototype may be the exception, not the rule.

Mechanization in other commodity markets has made sense only at scales large enough to rule out adoption for all but a minority of operators. The livestock sector, such as dairy, is a good example. Advances have been made in mechanical milking with the use of robotics but the technology generally requires 1,000 or more milk cows to reach the minimum scale necessary to justify the investment. Robotic milkers were introduced several years ago, yet costs are still so high that such a chance is prohibitive for 95 percent of all dairy operators.

While there is certainly potential for some added mechanization over the long term, the potential for many commodities is very limited or non-existent, regardless of the time frame. The fresh fruit and vegetable market is a good example. As already noted, human dexterity and judgment is needed in the picking and packing of produce to meet consumer demand and to address concerns about the lack of uniform maturity, incomplete mechanical fruit removal, mechanical bruising, and differences in readiness criteria. Next generation technology that addresses these needs is not even on a drawing board at this time.

Hence, advanced mechanization alternatives would require a revival of public-private investment in public-private research and development and a long-term congressional funding commitment. Even then, the contribution would likely be limited to some products and not others, concentrated in the longer term, and economically viable only at large enough scale to further restrict its impact.

VI. Designing a Viable Guest Worker Program

One approach to meeting U.S. homeland security concerns while accommodating agriculture's need for labor is to develop a viable guest worker program as an integral part of any legislation affecting migrant labor. The economic considerations identified earlier in this report suggest that such a program would have to have several critical components.

First, a viable guest worker program would have to accommodate a large number of workers efficiently. Providing just the agricultural sector with an uninterrupted supply of guest workers would require a program capable of handling 500,000 workers each year. The current H-2a program accommodates about 30,000. Handling the much larger volumes needed in agriculture would require streamlining the application and review process in both the U.S. and the country of origin in order to protect homeland security and facilitate worker flow.

Second, a viable guest worker program would allow the open market to determine wages and benefits. The existing program's "adverse effect" provisions have led DOL to issue arbitrary guidelines to protect the American worker from an influx of low-cost foreign labor that would bid down wage rates. Such has not been the case. As noted earlier,

agricultural wages are well above the minimum wage and wages in other industries such as food preparation. The DOL provisions in question do, however, work to raise wages and benefits for foreign farm workers above market-clearing levels without leading to any increase in Americans seeking farm jobs. Migrant farm labor hired through the program often costs \$14-17 per hour compared to the \$9.50 average for the sector. The increase in hired farm worker wages shown in Figure 2, combined with farm operator difficulties in securing American workers even at the higher wages paid over the last decade, indicate that any adverse impact on American workers is minimal at best. Market forces would prevent any widespread abuse in the future as Americans vote with their feet for jobs elsewhere in the economy even at substantially lower wages. Access to administrative remedies would be sufficient to address any isolated cases of abuse.

Third, a viable program would include provisions designed to meet agriculture's unique labor needs. For example, farmers generally need to lock in labor well in advance as part of their farm management plans. However, fluctuations in weather could move up or push back the dates labor is actually needed. Given the perishable nature of agricultural production, many farmers in question would not be able to "wait in line" behind other employers with non-perishable products. Many farmers' labor needs are also concentrated in short periods of time centered around harvest. Hence, a viable program would allow for worker movement between employers to provide a guest worker with long enough employment to make the program worthwhile. Many other farmers need year round labor that would not "fit" into a seasonal worker program.

Fourth, the NAWS survey indicates that migrant workers typically have an established work history with specific employers. The NAWS survey indicates that the average migrant worker has worked for the same employer/employers for more than four years and has been doing farm work in the U.S. for up to 10 years. A viable guest program would provide for continuing these established employer-employee links.

Note on Methodology

This analysis is subject to several limitations relating to data and methodology. On balance, these limitations suggest that the impact ranges cited in the text are best interpreted as orders of magnitude rather than precise estimates.

Regarding data, there are several sources with often conflicting observations. While the data tend to paint the same general picture, they can differ on specifics in any one year. For the purposes of this report, the National Agricultural Labor Survey conducted by USDA and the National Agricultural Workers Survey done by the Department of Labor were treated as definitive. Hence, for example, the report assumes that 53 percent of agriculture's hired work force would be affected by restrictions on migrant labor despite indications from other largely anecdotal sources that the number affected would be higher and the impact of restrictions consequently greater.

Regarding methodology, there has been relatively little research on farm labor markets done by USDA or the land grant universities. Hence, the econometric basis for doing

impact analysis does not exist. The same is true for the broader labor market, particularly for the range of jobs relevant for this analysis. The analysis here is based on the assumption that farmers would have to bid in the open market for labor to replace lost migrant workers. This makes understanding how labor markets operate and how the agricultural sector adjusts to across-the-board increases in labor costs critical.

Regarding operation of labor markets, this analysis assumes that the Department of Labor's surveys of wages and employment can be used to develop a rough approximation of the labor supply curve for the range of jobs relevant for a farm labor analysis. There are undoubtedly many other job categories with wages that fall between Figure 7's benchmarks, but not with sufficient numbers likely to shift to fill agriculture's job vacancies. In addition, the wages shown are averages, with distributions including significantly higher and lower wages. However, it was assumed that Figure 7's benchmarks could be used to sketch out a rudimentary schedule of the higher wages agriculture could expect to pay to attract and hold replacement workers.

As already noted, the analysis also assumes that labor moves freely between categories, and that labor movement between categories is based solely on relative wages as opposed to a combination of wages and job characteristics. And as already noted, the analysis makes no provision for the generalized upward pressure on wages above the \$14.35 per hour level that eliminating migrant workers across the economy could have. All of these labor assumptions work to reduce and "smooth out" the labor adjustment in agriculture.

These are particularly important assumptions for the agricultural sector, given production cycles that make producers sensitive to short term disruptions. This potential for disruption is most marked in the fruit and vegetable sectors – i.e. the sector with the most perishable product and greatest dependence on migrant workers. However, vulnerability to labor disruption extends to livestock operations faced with day-to-day operational needs and field crop operations faced with harvest-time labor needs. This suggests that an analysis based solely on replacement wage rates understates farm impacts. It also suggests that how restrictions on migrant labor are implemented is also of critical importance. The estimates outlined here assume implicitly that restrictions were implemented with enough lead-time for the sector to adjust – to find replacement workers. Without this lead-time, the impact would be significantly greater than estimated here.

Regarding operation of the agricultural economy, this analysis assumes that farmers have little flexibility in substituting other inputs for hired labor. The analysis also assumes that the farm sector would have difficulty passing higher labor costs on to consumers. The elasticities for the short and long term were .50-.66, indicating that half or more of the impact of a labor cost increase would take the form of an added production expense and income deduction. The analysis also assumes that the long term relationship between production receipts and income holds – that is, farmers lose \$.25 in income for every dollar in production displaced. These assumptions are consistent with the relationships at work in the Food and Agricultural Policy Institute's agricultural sector model and the USDA analysis underpinning the Department's Baseline. While these assumptions about

the labor market and the agricultural economy suggest that this report's estimates of the costs of restricting migrant labor could be low, several factors suggest that they could be high. For example, the estimates describe here make no provision for the sector's capacity to make structural changes that would minimize the need to hire replacement labor. While limited in the short term, the sector has adjusted to input cost increases in the past by modifying production technologies and changing the mix of inputs used in the production process. The materials presented here suggest, however, that the potential in the short term of one to five years is limited at best.

The analysis also provides for a distinction between short and long term impacts. The short term impacts are defined as one - two year impacts and do not provide for the full effect of a sustained across-the-board labor cost increase. The longer term impacts – three years or more – provide for the full impact of higher wages as agriculture moves up toward the top end of the \$11-14.35 range discussed in the text. The longer term impacts also incorporate the full impact of cost increases working through the vulnerability analysis to reduce production and raise costs.

These assumptions can be varied to establish a range around the income estimates described here. A lower bound on the income loss estimate can be established by assuming labor replacement costs would be lower, that farmers can pass along more of a cost increase to consumers, and that less production will exit the sector. This would lower the \$1.5-5 billion estimate to \$1-3.5 billion in the short term and the \$2.5-8 billion estimate for the long term to \$1.5-5 billion. Alternatively, assuming replacement wages are higher, that farmers are less able to pass along cost increases to consumers, and that more producers are forced to exit, the short term income loss would be \$2-6.5 billion and \$4-9.5 billion in the longer term.

In short, the impact of restricting agriculture's access to migrant labor is significant even with alternative more favorable assumptions for key parameters.